EMSP
Environmental Management Science Program

Mechanisms of Radionuclide-Hydroxycarboxylic Acid Interactions for Decontamination of Metallic Surfaces

Dr. A. J. Francis

Brookhaven National Laboratory

Project No.: 64946
Year of Award: 1998
Project Funding: $1,150,000

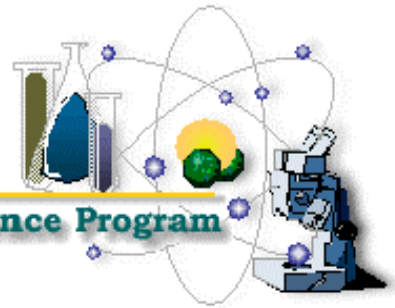
EMSP
Environmental Management Science Program

Project Goals

- Determine the nature of the association of radionuclides (U, Pu, Co and Sr) with stainless steel.
- Selectively remove the radionuclides using hydroxycarboxylic acids (citric acid and its analogs).

EMSP

Environmental Management Science Program



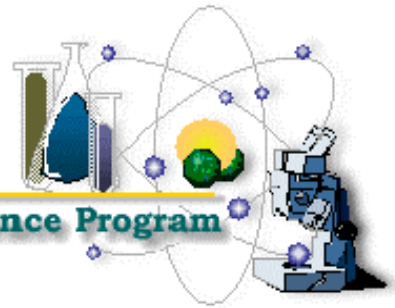
Technical Approach

The research will be conducted in three phases:

- Investigation of the basic mechanism of interaction of actinides with metal oxides on metallic surfaces
- Determine the interaction of hydroxycarboxylic acids (citric, malic and tartaric acids) with the actinide contaminated metallic surfaces
- Investigation of the interaction of hydroxycarboxylic acids with actual contaminated samples from DOE sites.

EMSP

Environmental Management Science Program



Research Plan

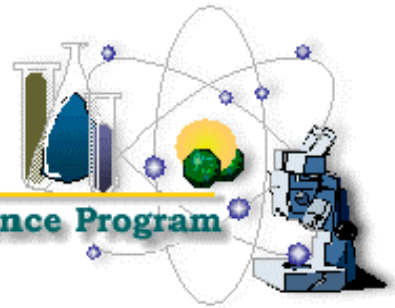
Phase I: Determine the coordination and attachment of radionuclides to surfaces.

Phase II: Determine the mechanisms of hydroxy-carboxylic acid complexation of radionuclides associated with metal oxide and metallic coupon surfaces, and in solution.

Phase III: Application of results from Phases I and II to actual contaminated material with emphasis on waste stream reduction.

EMSP

Environmental Management Science Program



Project Relevancy

STCG Number	Title
ID-S.2.06	Understanding the Physics and Chemistry of Metal Decontamination
None	Surface chemistry of metals and contaminant bonding
RF-DD10	Decontamination Of Non-Porous Surfaces